

Welcome!

# Physics 253: Fundamentals of Physics I

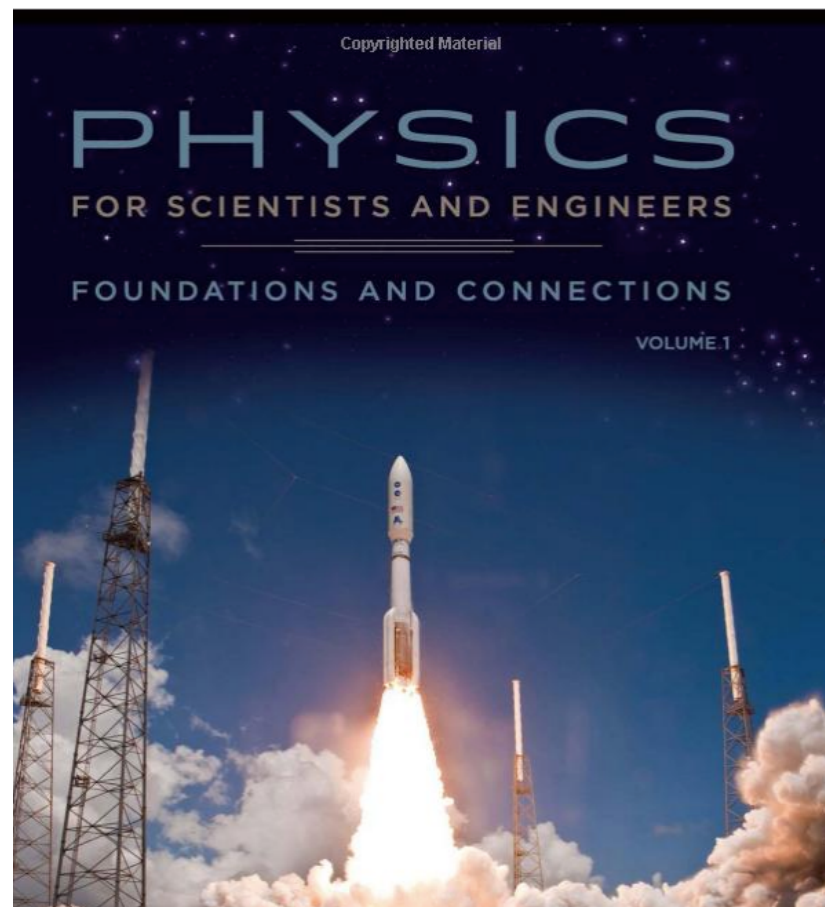
**This syllabus and course info can be found on Blackboard.**

**These PDF “slides” are an easy way for us to view the syllabus together in class; a separate single document is also provided on Blackboard with the same information**

# Class information

- Classes **MWF 12-1250 pm**  
**Faraday 143**
- Physics for Scientists and Engineers: Foundations and Connections (Katz), 1st edition is the **required** textbook (full version or just volume 1)
- WebAssign account **mandatory**
- Best option is to purchase Cengage Unlimited, since it is an e-book that also comes with the **required WebAssign account**
- We will cover **chapters 1-13** this semester (and a tiny bit of chapter 14, indirectly)

Co-requisite:  
**MATH 229**



**3 credit hours + 1  
(lab) = 4 total**

- Office Hours: Faraday 219
  - 1:00-2:00 pm Monday (right after class) and 10:45 am-11:45 am Wednesday (right before class); MASKS ARE REQUIRED DURING MY OFFICE HOURS (AND NO FOOD OR DRINK)
  - **Or by appointment (in person or by video conference)**
- Preferred method of communication: email ([jahred.adelman@niu.edu](mailto:jahred.adelman@niu.edu))
  - You can always try and stop by, but you will have better luck if you set up an appointment or come during the above times
  - I am not on campus every day

- Office Hours are literally **Open Office Hours** - no appointment necessary
  - Use them to talk about physics, homework, studying, exams, class, life, baseball or otherwise (within reason!)
  - If you want to meet, Office Hours are your first best choice
  - **Take advantage of this!** (You pay good money for it, literally)
- If you can't make office hours, send me your full availability during the week and we'll find a time to meet by Zoom, Teams or in person

## **Sections (for lab, all in Faraday 233):**

**253A:** Thursday 9:00 am - 11:50 am

**253B:** Monday 6:00 pm - 8:50 pm

**253C:** Tuesday 9:00 am - 11:50 am

**253D:** Wednesday 9:00 am - 11:50 am

**253E:** Tuesday 3:00 pm - 5:50 pm

**253F:** Thursday 6:00 pm - 8:50 pm

**253G:** Thursday 3:00 pm - 5:50 pm

**253I:** Wednesday 3:00 pm - 5:50 pm

**253J:** Tuesday 6:00 pm - 8:50 pm

**The pandemic is not over. Its continuation sucks.  
That is the best word that I can come up with.**

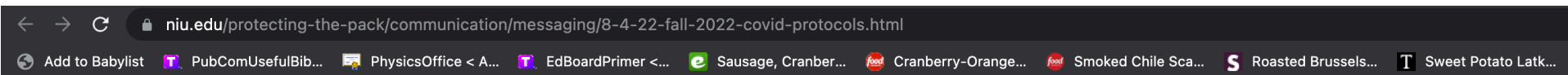
**If you have any health-related issues, please stay home and contact Health Services or your primary care doctor (and then contact me)!**

**If you have any mental health issues, please seek help+keep me posted. If your loved ones need help, please help them+keep me posted.**

**If you know anyone eligible for vaccines that isn't vaccinated, please encourage them to get a vaccine ... and a booster as eligibility allows**

<https://www.niu.edu/protecting-the-pack/communication/messaging/8-4-22-fall-2022-covid-protocols.html>

Masks are required AT ALL times in PHYS 253. Here and in your labs. They are not optional. It is not pleasant, but it is for your health and safety, my health and safety, and the health and safety of your friends and colleagues. If you do not follow this requirement, you will be asked to leave



## COVID-19 Protocols for the Fall 2022 Semester August 4, 2022

Dear Faculty and Staff,

I'm looking forward to the start of a new semester together and want to share with you timely information regarding COVID-19 and the recent rise in monkeypox cases across the country. As throughout the pandemic, NIU is in regular consultation with the DeKalb County Health Department and Northwestern Medicine to determine the best approaches for supporting the health and well-being of our community. Please review the information below and plan accordingly.

### Masks

- Similar to the spring 2022 semester, NIU faculty and instructors will determine if masks are required while in their teaching spaces. Please note that all classrooms remain fitted with HEPA filters to help with air circulation.



**Bandanas are not  
acceptable**



**ROBERT HOOKE**

**Neck gaiters are  
not acceptable**



**ISAAC NEWTON**

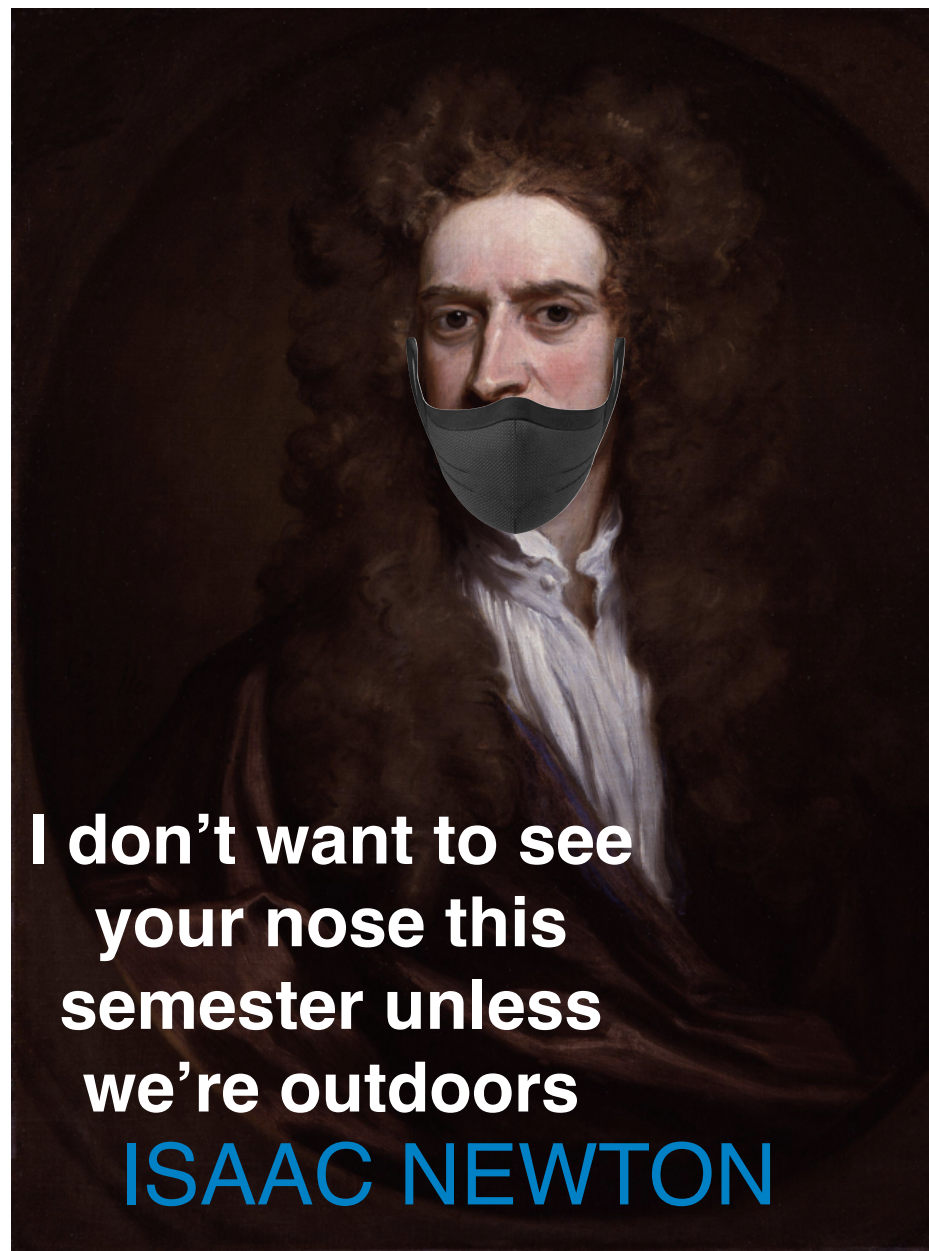


**This is not acceptable**



**ROBERT HOOKE**

**I don't want to see  
your nose this  
semester unless  
we're outdoors**



**ISAAC NEWTON**

YES!



ROBERT HOOKE

YES!



ISAAC NEWTON



# Why do we wear masks? (The pandemic is not over)

11

Though university policy states that we are “mask optional”, an important policy of PHYS 253 is an equitable and just atmosphere for all class members. If we are not protecting one another from COVID by masking, we are not providing such an environment.

**Refusing to mask indoors is a manifestation of ableism and racism, an exercise of individual privilege that tells the most vulnerable that their health and the health of their loved ones does not matter. Thus, masks are required here. They are NOT optional.**

**To practice community care, we will mask to protect those of us with compromised immune systems, those of us with family members unable to get vaccinated, those of us who do not want to transmit the virus to others, and those of us who want to avoid (re-)infection.**

**Look around. Your neighbor may be an immunocompromised cancer survivor. The person across the aisle may live with an elderly family member. Your colleague may have a newborn at home. If you think their health and well-being are not important, you do not belong in this class.**

# Course objectives

- i. Students will be able to describe, critically analyze, and solve problems based on a variety of physical systems using the physics concepts of:
  - i.i. Kinematics (in up to three dimensions)
  - i.ii. Newtonian mechanics (forces, Newton's laws, friction, circular motion, and gravitational forces and fields)
  - i.iii. Material properties and statics (deformation of elastic materials, and the analysis of static rigid objects and systems)
  - i.iv. Energy and Work (kinetic and potential energy, work from constant and changing forces, and conservation of energy in conservative and non-conservative systems)
  - i.v. Momentum and Impulse (linear momentum, conservation of linear momentum, and its application to collisions)
  - i.vi. Angular Kinematics and Dynamics (angular velocity and acceleration, torque, work and energy in rotating systems, and angular momentum)
- ii. Students will be able describe and analyze real-life physical systems using the above physics concepts
- iii. Students will collect, analyze, and interpret real data, as well as draw scientific conclusions based on that data.
- iv. Students will construct mathematical models of real-life physical systems
- v. Students will pose scientific questions, develop experiments to test these questions, and test models and hypotheses.
- vi. Students will develop technical and practical laboratory skills, including making measurements with standard equipment, recording measurements and observations, assessing measurement uncertainties, and propagating uncertainties to calculated quantities. They will also learn how computers can be used to collect, analyze and present data
- vii. Students will analyze and visualize data, using appropriate statistical methods, critically interpreting the validity and limitations of that data, and using appropriate plotting techniques to visually display that data.
- viii. Students will present results and ideas to others through written reports

**The major assessments are the weekly homework assignments, tests, final exam, and lab reports**

We'll keep busy  
this semester :)



- Problem sets every ~1 week, each with the same weight: combined total, 5% of grade
- Lab reports and lab work, with schedule and rules posted separately, 25% of grade
- Short online quizzes (**to make you read the appropriate material in advance!**) due before each we start each chapter in class, 5% of grade
  - Quizzes allow us to focus on problems, not only basic material
- Tests: **4 per semester (3 + final)**, in class, schedule on syllabus, total of 65% of grade (exam 1: 10%, exam 2: 15%, exam 3: 15%, final: 25%)
  - Note on exams: you will need to master one set of skills to do well on your future exams. Final is cumulative (entire course)

## On the grading of labs

See lab syllabus - however, two important things to note:

- (1) If you do not get a minimum of 60% on your total lab score, you will not be allowed to pass the larger course, even if you get a perfect score on everything else
- (2) It is up to you to ensure that your assignments are handed in correctly and received by the TA - when in doubt, email the TA!

**Most common (and easily avoidable) reasons for failing this course? Plagiarizing lab reports and/or failing to reach 60% in the lab by not handing things in on time. Self-plagiarizing from previous semesters, from the lab manual, or from others in your lab section also counts as plagiarism**

- Will be using WebAssign, connected to blackboard, for the homework and quizzes (Tools -> Access WebAssign)
- You should make sure to sign up and that you can access the homework **AS SOON AS POSSIBLE**
- Let me know if you run into troubles
- If you think your assignment was not graded correctly, **don't panic**
  - Take a screenshot (showing that it's your work) and come to office hours or send to me by email
  - **It is YOUR responsibility** to ensure that it is handed in and graded (you can take screenshots, with dates to be safe)
- Sign up using your NIU student email address
  - Please see extra slides on WebAssign if you have trouble accessing it

- All due as on the syllabus
  - I will often but not always announce this in class - it's up to you to stick to the schedule
  - Start the HW early! If you get stuck and need help, please head to the physics help room, ask your lab TAs, or talk to me
  - **NO** late homework will be accepted without penalty
    - Scores reduced by 10% for each day late except last assignment, when late homework not accepted
- It's your responsibility to remember to hit the submit button and to check that it's received!

- Some of the homework questions will be relatively easier, some of the questions will be relatively harder
  - That is OK! The homework is designed to make you think about the concept that we're using. Not all of it should be easy!
- Each homework set gets equal weight (and thus not all homework problems if one week has more problems or fewer problems)



- Late quizzes are not accepted (defeats the point)
- All quizzes get equal weight (same idea as for HW)
- The idea is that you should **read the book in advance** of us covering a chapter or subject
  - This way, we spend less time regurgitating the book and more time with you practicing interesting problems
  - How to do well on quizzes? **READ THE BOOK**
  - Unlike for the HW, you get points deducted for each quiz submission (I want you to read the book!)
- As with HW, your responsibility to check that it is received, not mine

We have no quiz for the first chapter, but I **strongly encourage everyone to read it ASAP** so that it's easier to follow along as we go over the material! No reason to fall behind early. There is also a **quiz on how to use WebAssign**

- There will absolutely be **no make-up tests**, and tests cannot be taken at a different time for any reason unless you document this at the beginning of the semester (such as if you are an athlete)
- In the case of convincing and well-documented emergencies the missed test grade may be waived, however, do not assume this is automatic.
  - I need to see some **convincing evidence** of a valid, good emergency. **Faking an emergency is worse than missing an exam**, and will be brought to the attention of the appropriate NIU personnel as potential academic misconduct

- No electronic devices of any kind allowed during tests
  - Calculators the sole exception during exams (but only a calculator without internet access, nothing beyond that), **definitely useful to have, let me know in advance if you do not have one**
  - If you are spotted with your phone or other electric item out during an exam, you fail it
- It's fine to use electronics during the course, as long as it is **not distracting** to me or to other students (if it is, I will ask you to stop). And it's needed for filling out google forms
- You can take a **single** "cheat sheet" of material with you to each exam, but no other paperwork

- **Cheating is a serious subject** - just avoid it at all costs!
  - If you are found cheating on an exam, appropriate measures will be taken up with the Office of Community Standards and Student Conduct (this is serious, folks!)
  - Plagiarism on lab reports is an equally serious offense. We will be using SafeAssign for your lab reports. This will spot your plagiarism, and you will be held accountable for it



## How and where to get help

- The **physics help room** is a great resource (find your TAs, other TAs, or whomever you like working with)
  - The point of the help room is not to solve problems for you but to help you when you are stuck and to help you learn!
- My **office hours** or a chat with me by **appointment**
- **Your TAs** can help before or after lab (or you can write to them as needed)
- **Your colleagues** in the class are a great resource!
  - Learn from one another
- Don't hesitate to reach out to **Huskie Academic Support Center** as needed

I do not drop exam scores, but I will drop the lowest quiz and lowest HW score at the end of the semester

- Your attendance grade will be used as an **extra-credit bonus**, with a maximum of 6% for 100% attendance over the full semester (so attending half of the classes is a 3% bonus, etc)
- Attendance-taking for extra credit will start in the third week of the semester, though of course you should not stop coming before then!
- How will I check attendance?
  - **The LAs will help with this!** In other words, you should sit with your assigned groups
  - Attendance is extra credit only, so **no excuses** for missing class are granted. No need to inform me if you will miss class, but you are more than welcome to do so
- **You should come to every class** (shouldn't need to ask this of you, but I state it anyway)

- **Food and drinks are not allowed in classrooms this semester, as you are supposed to wear your mask at all times**
  - If you need to eat or drink something, step outside (of the classroom and of the building!)
  - This is true in the main class and even more so in the labs
  - **Talk to me privately if this is a problem**

## More info on the labs

- If things are unclear, please ask for help! (You can ask me, or your TA, or one of the other TAs)
- **Read the lab syllabus carefully**
- Includes lab work on a computer, using programming in Python (no prior experience required), an extremely useful skill!
- You are expected to remain in the “lab” for the entire 2 hours 50 minutes
  - TAs will use extra time for recitation and going over additional problems
  - Do not plan on leaving early. Your TAs will inform you when it is OK to leave. If you leave early, you may not receive participation points for the lab
- Those acting in a disruptive or disrespectful manner can have points removed from lab grade
- Questions? Ask!



**Feel free to interrupt to ask questions, either by raising your hand or just shouting out**

You should be checking your email and blackboard **at least once per day**

”I don’t check my email” or “I didn’t see that message on blackboard” are **not** valid excuses

If you have trouble with homework, or with class or with lab, it’s your responsibility to contact me and/or your lab TAs as far in advance as possible.

Informing us early of troubles will do you a lot more good than not informing us or informing us after-the-fact

## Disability statement

If you need an accommodation for this class, please contact the Disability Resource Center **as soon as possible**. The DRC coordinates accommodations for students with disabilities. It is located in the Campus Life Building, Suite 180 and can be reached at 815-753-1303 (V) or via [drc@niu.edu](mailto:drc@niu.edu). Also, please contact me privately as soon as possible so we can discuss your accommodations. Please note that you will not be required to disclose your disability, only your accommodations. The sooner you let me know your needs, the sooner I can assist you in achieving your learning goals in this course.

My aim is for you to enjoy this course and to learn the material - please let me work with you so that we can achieve our goals.